LAV$_{ELI}$
Attorney Docket
No. GUPL

DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that: my residence, post office address and citizenship are as stated below next t my name; that I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joir inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the inventio entitled: A VARIANT OF LAV VIRUSES

the specification of which is ☒ attached and/or ☒ was filed on 13 April 1987 as Application Serial No 038.332 and was amended on (if applicable) ....

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

COUNTRY	APPLICATION NUMBER	DATE OF FILING	PRIORITY CLAIMED UNDER 35 U.S.C. 119
European Patent Convention	86401380.0	23 June 1986	☒ YES ☐ NO
			☐ YES ☐ NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION NUMBER	DATE OF FILING	STATUS (Patented, Pending, Abandoned)

I hereby appoint the following attorneys to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Finnegan, Henderson, Farabow, Garrett and Dunner, Reg. No. 22,540; Douglas B. Henderson, Reg. No. 20,291; Ford. F. Farabow, Jr., Reg. No. 20,630; Arthur S. Garrett, Reg. No. 20,338; Donald R. Dunner, Reg. No. 19,073; Brian G. Brunsvold, Reg. No. 22,593; Tipton D. Jennings, IV, Reg. No. 20,645; Jerry D. Voight, Reg. No. 23,020; Laurence R. Hefter, Reg. No. 20,827; Kenneth E. Payne, Reg. No. 23,098; Herbert H. Mintz, Reg. No. 26,691; C. Larry O'Rourke, Reg. No. 26,014; Albert J. Santorelli, Reg. No. 22,610; Michael C. Elmer, Reg. No. 25,857; Richard H. Smith, Reg. No. 20,609; Stephen L. Peterson, Reg. No. 26,325; John M. Romary, Reg. No. 26,331; Bruce C. Zotter, Reg. No. 27,680; Dennis P. O'Reilley, Reg. No. 27,932; Allen M. Sokal, Reg. No. 26,695; Robert D. Bajefsky, Reg. No. 25,387; Richard L. Stroup, Reg. No. 28,478; David W. Hill, Reg. No. 28,220; Thomas L. Irving, Reg. No. 28,619; Charles E. Lipsey, Reg. No. 28,165; Thomas W. Winland, Reg. No. 27,605; and .... Please address all correspondence to FINNEGAN, HENDERSON, FARABOW, GARRETT AND DUNNER, 1775 K Street, N.W., Washington, D.C. 20006, Telephone No. (202) 293-6850.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Listing of Inventors Con[redacted] Page 2 hereof. ☐ Yes ☐ No

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INVENTOR'S SIGNATURE
DATE
RESIDENCE
CITIZENSHIP
POST OFFICE ADDRESS

FULL NAME OF THIRD JOINT INVENTOR, IF ANY
INVENTOR'S SIGNATURE
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RESIDENCE
CITIZENSHIP
POST OFFICE ADDRESS

FULL NAME OF SOLE OR FIRST INVENTOR
INVENTOR'S SIGNATURE
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FULL NAME OF THIRD JOINT INVENTOR, IF ANY
INVENTOR'S SIGNATURE
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FULL NAME OF S[illegible] INVENTOR, IF ANY
INVENTOR'S SIGNATURE
DATE
RESIDENCE
CITIZENSHIP
POST OFFICE ADDRESS

FULL NAME OF THIRD JOINT INVENTOR, IF ANY
INVENTOR'S SIGNATURE
DATE
RESIDENCE
CITIZENSHIP
POST OFFICE ADDRESS

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER • WASHINGTON, D.C.

PATENT
Attorney Docket No. 2356.0010-04

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Marc ALIZON et al.	)	
	)	
Application No.: Unassigned (Cont. of U.S.S.N. 08/423,477 (4/19/95))	)	Group Art Unit: Unassigned
	)	
	)	
Filed: January 23, 2001	)	Examiner: Unknown
	)	
For: VARIANT OF LAV VIRUSES	)	

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

SUBMISSION OF FORMAL DRAWINGS

Subject to the approval of the Examiner, applicants submit the attached 34 sheets of Formal Drawings (Figs. 1A, 1B, 2, 3A-1, 3A-2, 3B-1, 3B-2, 3C-1, 3C-2, 3D-1, 3D-2, 3E-1, 3E-2, 3F-1, 3F-2, 4A, 4B, 5, 6A-1, 6A-2, 6A-3, 6B-1, 6B-2, 6B-3, 6B-4, 7A, 7B, 7C, 7D, 7E, 7F, 7G, 7H, and 7I). If the Formal Drawings for any reason are not in full compliance with the pertinent statutes and regulations, please so advise the undersigned.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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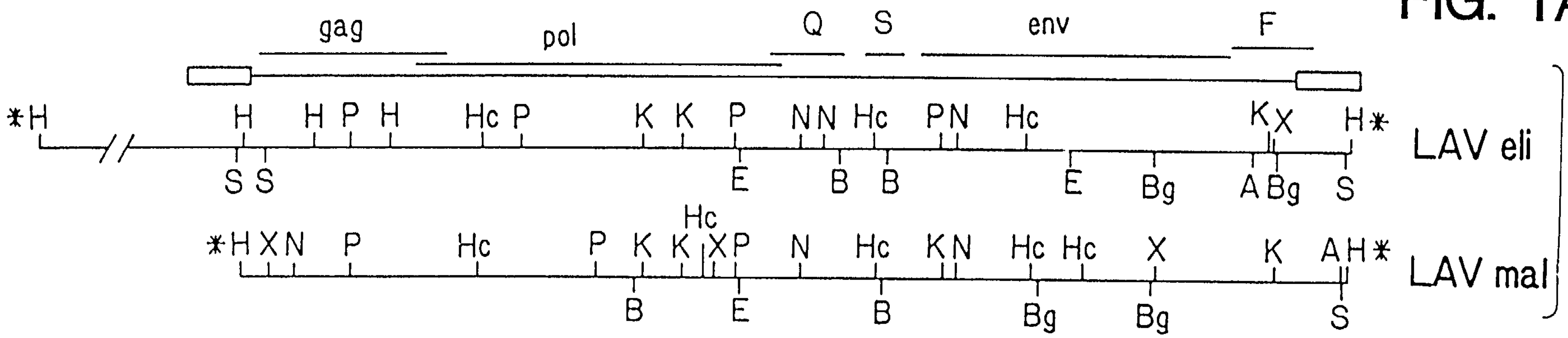
Date: January 23, 2001


gag
pol
Q
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*H
H H P H Hc P K K P N N Hc P N Hc K X H*
S S E B B E Bg A Bg S
LAV eli
H X N P Hc P K K Hc X P N Hc K N Hc Hc X K A H
B E B Bg Bg S
LAV mal

FIG. 1A

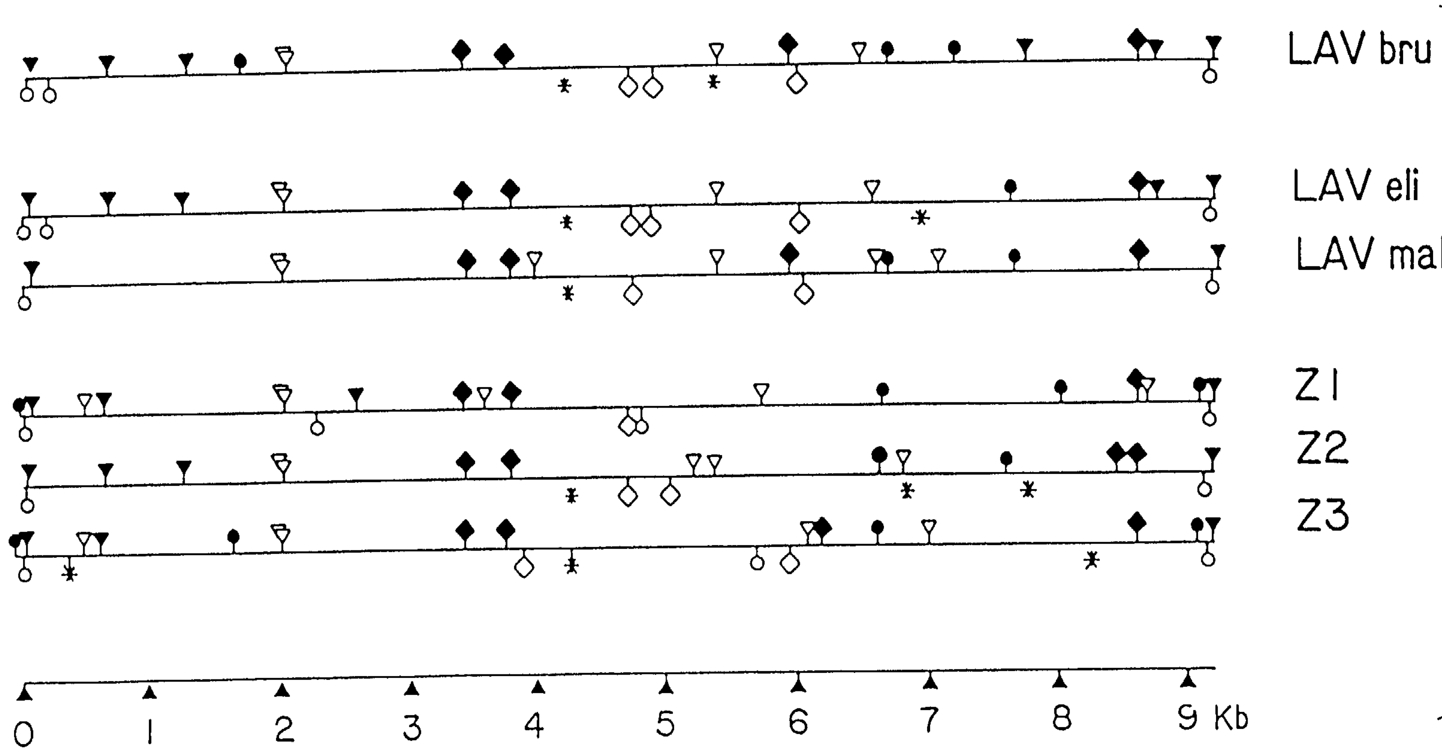
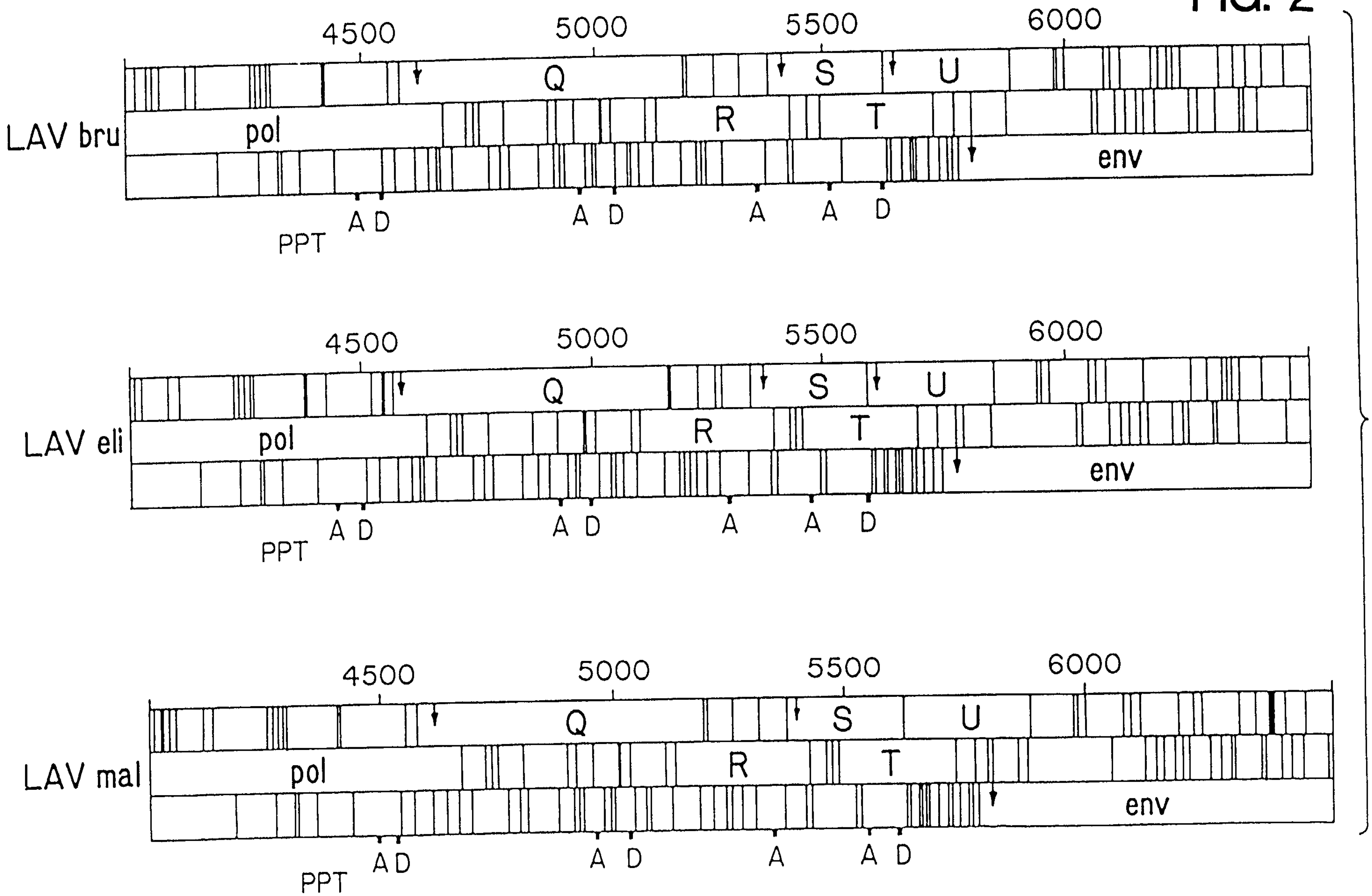


FIG. 1B



4500
5000
5500
6000
LAV bru
Q
S
U
pol
R
T
env
A D
A D
A
A
D
PPT
LAV eli
LAV mal

FIG. 2

GAG

```
                  10         20         30         40         50         60         70         80
LAV BRU   MGARASVLSG GELDRWEKIR LRPGGKKKYK LKHIVWASRE LERFAVNPGL LETSEGCRQI LGQLQPSLQT GSEELRSLYN
ARV 2                    K                                 L        C   Q   ME   ST K      IK
LAV MAL               K  A               R    L          Y L            K   I     AI    T
LAV ELI               K  K               R

                                                                        p25
                                                                         ↓
                  90        100        110        120        130        140        150        160
LAV BRU   TVATLYCVHQ RIEIKDTKEA LDKIEEEQNK SKKKAQQAAA ------DTGH SSQVSQNYPI VQNIQGQMVH QAISPRTLNA
ARV 2                  DV        E                    ----AAG  N               L
LAV MAL                DV             I     RQ T      AQQAAAA KN   S           A    I
LAV ELI            K G DV        E M                  -------  N N             L

                 170        180        190        200        210        220        230        240
LAV BRU   WVKVVEEKAF SPEVIPMFSA LSCGATPQDL NTMLNTVGGH QAAMQMLKET INEEAAEWDK VHPVHAGPIA PGQMREPRGS
ARV 2
LAV MAL       I                             M   I             D        D             P
LAV ELI       I                                                                 L

                 250        260        270        280        290        300        310        320
LAV BRU   DIAGTTSTLQ EQIGWMTNNP PIPVGEIYKR WIILGLNKIV RMYSPTSILD IRQGPKEPFR DYVDRFYKTL RAEQASQEVK
ARV 2                                                                                         D
LAV MAL                     S        D                     V                      F         T
LAV ELI                 A   S                 V            V                                  D
```

FIG. 3A-1

```
                 330        340        350        360        370        380        390        400
                                                                                ↓p13
LAV BRU   NWMTETLLVQ NANPDCKTIL KALGPAATLE EMMTACQGVG GPGHKARVLA EAMSQVTNS- ATIMMQRGNF RNQRKIVKCF
ARV 2                                                                    P-  N              T
LAV MAL                                G                  S             A   T  A         KG - RI
LAV ELI                                Q                  S             A   V T A        KGP   I

                 410        420        430        440        450        460        470        480
LAV BRU   NCGKEGHIAR NCRAPRKKGC WKCGKEGHQM KDCTERQANF LGKIWPSYKG RPGNFLQSRP EPTAPPFLQS RPEPTAPPEE
ARV 2              K             R  R                                             ---- ---------
LAV MAL          L                                           H                    ---- ---------A
LAV ELI            K             R     L                R    H                    ---- ---------A

                 490        500        510
LAV BRU   SFRSGVETTT PSQKQEPIDK ELYPLTSLRS LFGNDPSSQ
ARV 2        F E K
LAV MAL     GF E IK-        QK        A  K       QL
LAV ELI     GF E I -        QK           K        L
```

FIG. 3A–2

Central Region: Q

```
                  10         20         30         40         50         60         70         80
LAV BRU   MENRWQVMIV WQVDRMRIRT WKSLVKHHMY VSGKARGWFY RHHYESPHPR ISSEVHIPLG DARLVITTYW GLHTGERDWH
ARV 2                                      I K  K           T    V            K               E
LAV MAL                        H           K  KN          R  K V               VR      Q   K
LAV ELI                  K               K  NR             K            E     K           E

                  90        100        110        120        130        140        150        160
LAV BRU   LGQGVSIEWR KKRYSTQVDP ELADQLIHLY YFDCFSDSAI RKALLGHIVS PRCEYQAGHN KVGSLQYLAL AALITPKKIK
ARV 2          A       K        G        H       E    KN I  YR                                 T
LAV MAL     H        Q      L   D                E     Q I          D                  T   A   TR
LAV ELI               R         G       M        E       I  D                          T   A  Q

                 170        180        190
LAV BRU   PPLPSVTKLT EDRWNKPQKT KGHRGSHTMN GH
ARV 2           K
LAV MAL         R            Q
LAV ELI         R            Q  R
```

FIG. 3B–1

```
                R

                       10         20         30         40         50         60         70         80

LAV BRU   MEQAPEDQGP QREPHNEWTL ELLEELKNEA VRHFPRIWLH GLGQHIYETY GDTWAGVEAI IRILQQLLFI HFRIGCRHSR
ARV 2                    Y                R          P    S   Y                                  Q
LAV MAL         A                         Q               S              E         S             Q
LAV ELI         A        Y   A            S               S              V                       Q

                       90

LAV BRU   IGVTQQRRAR -NGASRS
ARV 2       II       R
LAV MAL     I R      -  S
LAV ELI     IIR      -  S

                S (tat)

                       10         20         30         40         50         60         70

LAV BRU   MEPVDPRLEP WKHPGSQPKT ACTTCYCKKC CFHCQVCFTT KALGISYGRK KRRQRRRPPQ GSQTHQVSLS KQ
ARV 2           N            R    NN           YA   R  G                   A  D     A
LAV MAL     D   N      N     R  P NK         Y   M  I  G                      N A  DP P E
LAV ELI     D   N      N     R  P NK H       Y  P   LN G                 G    G A   PIP
```

FIG. 3B-2

POL

```
                  10         20         30         40         50         60         70         80
LAV BRU   FFREDLAFLQ GKAREFSSEQ TRANSPTFSS EQTRANSPTR RELQVWGRDN NSLSEAGADR QGTVSFNFPQ ITLWQRPLVT
ARV 2                                --- ---------         GE
LAV MAL       N   P        P           --- ---------S    R   G - KT   T  E   I    S            V
LAV ELI       N   P     G L PK         --- ---------S    R     -  P  KT  E                      A

                  90        100        110        120        130        140        150        160
LAV BRU   IKIGGQLKEA LLDTGADDTV LEEMSLPGRW KPKMIGGIGG FIKVRQYDQI LIEICGHKAI GTVLVGPTPV NIIGRNLLTQ
ARV 2      R                        N   K                        PV
LAV MAL   VRV                      IN   K                              K      I              M
LAV ELI                             N   K                        P     Q

                 170        180        190        200        210        220        230        240
LAV BRU   IGCTLNFPIS PIETVPVKLK PGMDGPKVKQ WPLTEEKIKA LVEICTEMEK EGKISKIGPE NPYNTPVFAI KKKDSTKWRK
ARV 2
LAV MAL                               R                T  KD         L
LAV ELI                                                T   D          R           I

                 250        260        270        280        290        300        310        320
LAV BRU   LVDFRELNKR TQDFWEVQLG IPHPAGLKKK KSVTVLDVGD AYFSVPLDED FRKYTAFTIP SINNETPGIR YQYNVLPQGW
ARV 2                                                         K
LAV MAL     N
LAV ELI                                                                   S
```

FIG. 3C–1

```
                330        340        350        360        370        380        390        400
LAV BRU  KGSPAIFQSS MTKILEPFRK QNPDIVIYQY MDDLYVGSDL EIGQHRTKIE ELRQHLLRWG LTTPDKKHQK EPPFLWMGYE
ARV 2                                                                       F
LAV MAL                      T K  E                                 E   K   F
LAV ELI                           EM                             K  E       F R

                410        420        430        440        450        460        470        480
LAV BRU  LHPDKWTVQP IVLPEKDSWT VNDIQKLVGK LNWASQIYPG IKVRQLCKLL RGTKALTEVI PLTEEAELEL AENREILKEP
ARV 2                M                            A     K
LAV MAL              Q  D E                             K         A    DIV    A
LAV ELI           S  K    E         N  ER

                490        500        510        520        530        540        550        560
LAV BRU  VHGVYYDPSK DLIAEIQKQG QGQWTYQIYQ EPFKNLKTGK YARTRGAHTN DVKQLTEAVQ KITTESIVIW GKTPKFKLPI
ARV 2      E          V                                  M                   VS          I
LAV MAL                                     QY           IKS                  AQ             R
LAV ELI                         H                        M            A     R S         R    R
```

FIG. 3C-2

```
                  570        580        590        600        610        620        630        640
LAV BRU    QKETWETWWT EYWQATWIPE WEFVNTPPLV KLWYQLEKEP IVGAETFYVD GAASRETKLG KAGYVTNRGR QKVVTLTDTT
ARV 2            A  M                                                N                D         SIA
LAV MAL          A                                 T                 N    K           D         S  E
LAV ELI             A                                     I          N                D         P

                  650        660        670        680        690        700        710        720
LAV BRU    NQKTELQAIH LALQDSGLEV NIVTDSQYAL GIIQAQPDKS ESELVNQIIE QIIKKEKVYL AWVPAHKGIG GNEQVDKLVS
ARV 2                                                       S
LAV MAL                      S                          I          Q D        S
LAV ELI             N

                  730        740        750        760        770        780        790        800
LAV BRU    AGIRKVLFLD GIDKAQDEHE KYHSNWRAMA SDFNLPPVVA KEIVASCDKC QLKGEAMHGQ VDCSPGIWQL DCTHLEGKVI
ARV 2               N       E                                                                I
LAV MAL    S                E                      I                                         I
LAV ELI    Q                E             N

                  810        820        830        840        850        860        870        880
LAV BRU    LVAVHVASGY IEAEVIPAET GQETAYFLLK LAGRWPVKTI HTDNGSNFTS TTVKAACWWA GIKQEFGIPY NPQSQGVVES
ARV 2
LAV MAL    I                             I          VV            AA         N
LAV ELI                                             VV            AA
```

FIG. 3D-1

```
                890        900        910        920        930        940        950        960
LAV BRU  MNKELKKIIG QVRDQAEHLK TAVQMAVFIH NFKRKGGIGG YSAGERIVDI IATDIQTKEL QKQITKIQNF RVYYRDSRDP
ARV 2      N                                                                                KK
LAV MAL                E                                    I M                             N
LAV ELI                                       RR            I                  I

                970        980        990       1000       1010
LAV BRU  LWKGPAKLLW KGEGAVVIQD NSDIKVVPRR KAKIIRDYGK QMAGDDCVAS RQDED
ARV 2
LAV MAL  I                                                    G G
LAV ELI  I                     K          V
```

FIG. 3D-2

ENV

```
                                    SP                                 OMP
                 10         20         30         40         50         60         70         80
LAV BRU   MRVK---EKY QHLWRWGWKW GTMLLGILMI CSATEKLWVT VYYGVPVWKE ATTTLFCASD AKAYDTEVHN VWATHACVPT
ARV 2      K   GTRRN        --- - L   M                                    R
LAV MAL       REIQRN  NW    --- -M    M  T   IA D                            S E      I
LAV ELI     ARGIERNC  NW K  --- -I       T    ADN                            S E  A   I

                 90        100        110        120        130        140        150        160
LAV BRU   DPNPQEVVLV NVTENFNMWK NDMVEQMHED IISLWDQSLK PCVKLTPLCV SLKCTDL-CN ATNTNSSNTN SSSGEMMME-
ARV 2              C             N     Q                       T N    - K        --- ----NWKE I
LAV MAL         IE E     G       N                             T N  NVN T  V GTNACS  RTNA LK  I
LAV ELI         IA E             N                             T N S E--L RN GTMG NV TTEEKG----

                170        180        190        200        210        220        230        240
LAV BRU   KGEIKNCSFN ISTSIRGKVQ KEYAFFYKLD IIPIDNDTTS -----YTLTS CNTSVITQAC PKVSFEPIPI HYCAPAGFAI
ARV 2                 T    D I    N L RN  VV    AS T TNYTN R IN   R                        T
LAV MAL   -  V         TPVGSD R -   T  N  LVQ  DSDN  ----S R IN                  T D
LAV ELI   ---M        VT VLKD K QV  L  R   V     SST -NSTN R IN     A

                250        260        270        280        290        300        310        320
LAV BRU   LKCNKKTFNG TGPCTNVSTV QCTHGIRPVV STQLLLNGSL AEEEVVIRSA NFTDNAKTII VQLNQSVEIN CTRPNNNTRK
ARV 2                K                  I                     D    N          E  A
LAV MAL       D K      EI K           K                   IM  E  L   T N      ET T      G    R
LAV ELI      RD K                                          I   E  L N   N  AH  E  K T  A  YQ   Q
```

FIG. 3E-1

```
            330        340        350        360        370        380        390        400
                                 •                                                    •
BRU  SIRIQRGPGR AFVTIGK-IG NMRQAHCNIS RAKWNATLKQ IASKLREQFG NNKT-IIFKQ SSGGDPEIVT HSFNCGGEFF
2      Y --       W T RI   DI K         Q  N  E   VK            - V N           M      R
MAL  G HF--   Q  LY T I-V  DI R Y T N ETE DK  Q  V V  GSLL- -   K   NS         T       R
ELI  RTP -- L Q SLY TKS-RS IIG          Q SK  Q  V R  GTLL- -   I K  P         T

            410        420        430        440        450        460        470        480
      •                                    •                            •
BRU  YCNSTQLFNS TWFNSTWSTE CSNNTEGSDT ITLPCRIKQF INMWQEVGKA MYAPPISGQI RCSSNITGLL LTRDGGNN--
2       T     N   -----RLN RTEG K N    I       I                  C    S                T -V
MAL     TSK       Q NGARL- -  S  STGS          I      KT          A V  N L      I        NSSD
ELI     TSG       NI A NNI TES NSTNTN    Q     I  K VAGR-   I     ERN  L                 I --

                                                                        TMP
            490        500        510        520        530↓       540        550        560
BRU  NNGSEIFRPG GGDMRDNWRS ELYKYKVVKI EPLGVAPTKA KRRVVQREKR AVGI-GALFL GFLGAAGSTM GARSMTLTVQ
2    T DT V                       I      I                     V  M                  V L
MAL   SDN TL            I          R                    E       I L-  M                  A L
ELI   STN T                        Q          R         E       I L-  M                    V
```

FIG. 3E-2

```
                 570        580        590        600        610        620        630        640
LAV BRU   ARQLLSGIVQ QQNNLLRAIE AQQHLLQLTV WGIKQLQARI LAVERYLKDQ QLLGIWGCSG KLICTTAVPW NASWSNKSLE
ARV 2                                             W        R
LAV MAL                                           W        Q   R   M       H    F     S    R  D
LAV ELI       M                                                             H    N     S    R  N

                 650        660        670        680        690        700        710        720
LAV BRU   QIWNNMTWME WDREINNYTS LINSLIEESQ NQQEKNEQEL LELDKWASLW NWFNITNWLW YIKIFIMIVG GLVGLRIVFA
ARV 2     D  D     Q  E   D   N T YT L                              S
LAV MAL   D        Q  EK  S   G I YN       I      K                 S SK      R   IV     I    I
LAV ELI   E  Q        E   D   G   Y        T      K                 S  Q            I    I

                 730        740        750        760        770        780        790        800
LAV BRU   VLSIVNRVRQ GYSPLSFQTH LPTPRGP-DR PEGIEEEGGE RDRDRSIRLV NGSLALIWDD LRSLCLFSYH RLRDLLLIVT
ARV 2                         R   V    -    D               V    D F     E           R         AA
LAV MAL      L             L  L        P             QG G         FS         N                A
LAV ELI      L                L   A    -       T      G    V  L   FS                      I  AV

                 810        820        830        840        850        860        870
LAV BRU   RIVELLGRRG WEALKYWWNL LQYWSQELKN SAVSLLNATA IAVAEGTDRV IEVVQGACRA IRHIPRRIRQ GLERILL
ARV 2      T  I  K           S      I              W        T          A R Y   L  H          L
LAV MAL                     L       G        I    T       C     IG RFG   L           F  A
LAV ELI              DI    L             R     S  FD I              II R     VLN             S
```

FIG. 3F–1

F

```
                  10         20         30         40         50         60         70         80
LAV BRU  MGGKWSKSSV VGWPTVRERM R----RAEPA ADGVGAASR- ----DLEKUG AITSSNTAAT NAACAWLEAQ EE-EEVGFPV
ARV 2         R M G   SAI      RAEP                V  - ----                      D          -
LAV MAL         I      KI    I ----  TP T ET      V QD AVSQ  D C    AA   SP  N   S --- PP    E
LAV ELI         I      AI    I ----  TM           V  - ----                 S    D           SD

                  90        100        110        120        130        140        150        160
LAV BRU  TPQVPLRRHT YKAAVDLSHF LKEKGGLEGL IHSQRRQDIL DLWIYUTQGY FPDWQNYTPC PGVRYPLTFG WCYKLVPVEP
ARV 2    R                L  I              W     E                                I          F
LAV MAL  R             G  F             D VW PK   E       V                        I F        F     HS
LAV ELI  R             E  L                W KK   E       V N     I                I            E    D

                 170        180        190        200        210
LAV BRU  DKVEEANKGE NTSLLHPVSL HGMDDPEREV LEWRFDSRLA FHHVARELHP EYFKNC
ARV 2    E       E   N     M     E A K    V     K       M          Y D
LAV MAL  EE      E   NC    I Q   E A      K K   S    LR R    Q     Y D
LAV ELI  QE    DTE  TN     ICQ   E    Q   K   N       E K    M    FY  -
```

FIG. 3F–2

FIG. 4A

A LAVbru vs.	GAG		POL		ENV TOTAL		ENV OMP		ENV TMP	
HTLV-3 USA	512 0/0	0.8	1015 0/0	1.3	856 5/0	1.4	507 5/0	1.6	349 0/0	1.1
ARV-2 USA	502 12/2	3.4	1003 12/0	3.1	855 17/11	13.0	505 17/10	14.3	350 0/1	11.2
LAVeli ZAIRE	500 13/1	9.8	1002 13/0	5.5	853 22/14	20.7	504 22/14	25.3	349 0/0	13.8
LAVmal ZAIRE	505 14/7	12.0	1002 13/0	7.7	859 13/11	21.7	509 13/10	26.4	350 0/1	14.9

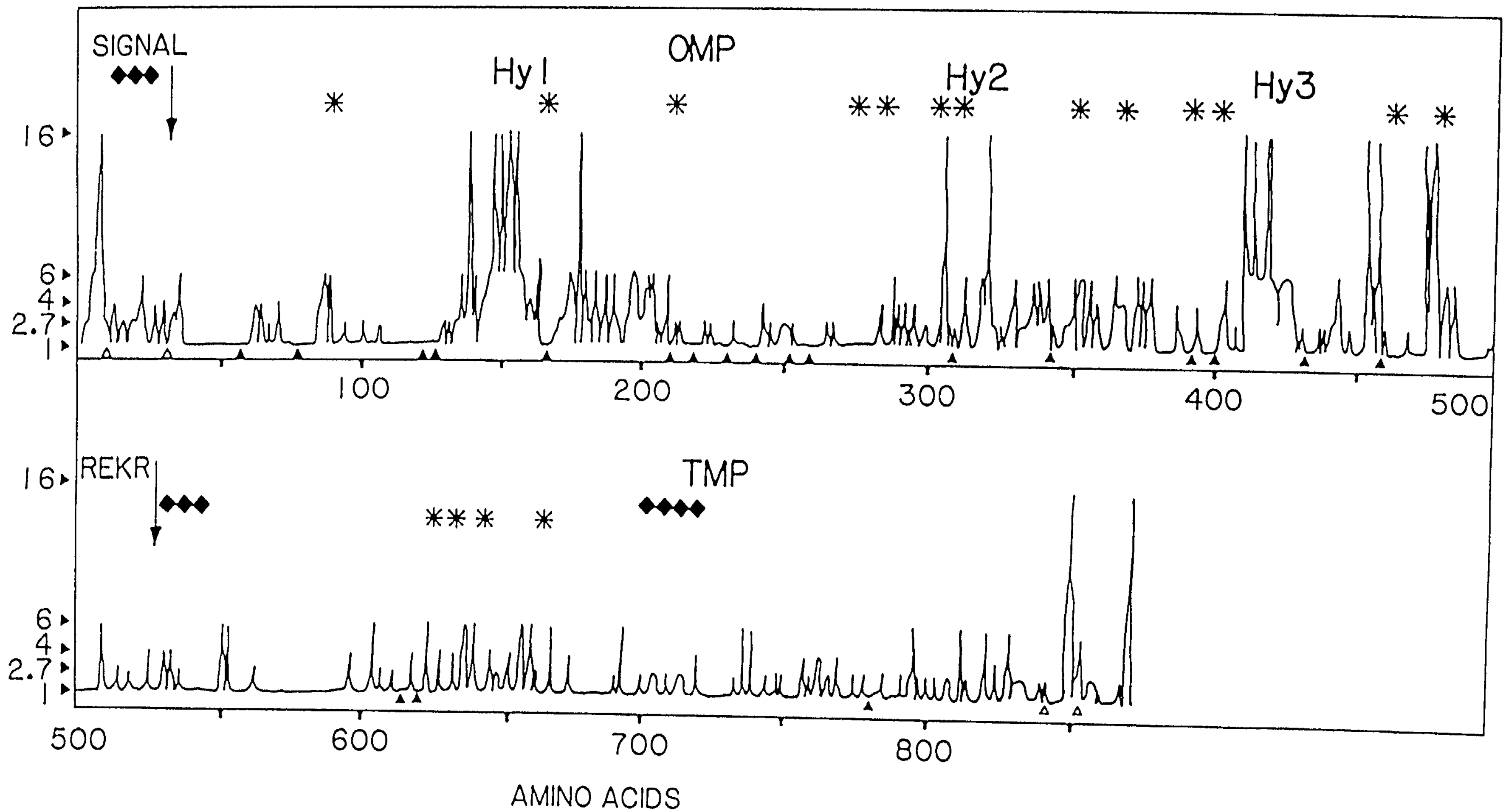
B LAVeli vs.										
LAVmal	505 1/6	10.8	1002 0/0	8.4	859 13/11	19.8	509 8/13	23.6	350 0/1	14.3

FIG. 4B

A LAVbru vs.	orf F		central region: orf Q		central region: orf R		central region: orf S	
HTLV-3 USA	206 0/0	1.5	192 0/0	0		nd	80 0/0	2.5
ARV-2 USA	210 0/4	12.6	192 0/0	10.0	97 0/1	9.4	81 0/1	15.0
LAVeli ZAIRE	206 1/1	19.4	192 0/0	10.4	96 0/0	11.5	80 0/0	27.5
LAVmal ZAIRE	209 2/5	27.0	192 0/0	12.6	96 0/0	10.4	80 0/0	23.8

B LAVeli vs.	orf F		central region: orf Q		central region: orf R		central region: orf S	
LAVmal	209 3/6	22.5	192 0/0	12.0	96 0/0	6.3	80 0/0	11.3

FIG. 5



SIGNAL
Hy1
OMP
Hy2
Hy3
REKR
TMP
16
6
4
2.7
1
100
200
300
400
500
600
700
800
AMINO ACIDS

```
GAG

a
                         120

          K   A   Q   Q   A   A   A                        D   T
LAV.BRU  AAA GCA CAG CAA GCA GCA GCT   -   -   -   -   -   GAC ACA

          K   A   Q   Q   A   A   A   A   A -  -   -   -   G   T
ARV 2    AAG GCA CAG CAA GCA GCA GCT GCA GCT               GGC ACA

          K   T   Q   Q   A   A   A   A   Q   Q   A   A   A   A   T
LAV.MAL  AAG ACA CAG CAG GCA GCA GCT GCA CAG CAG GCA GCA GCT GCC ACA

          X   A   Q   Q   A   A   A                            D   T
LAV.ELI  AAG GCA CAG CAA GCA GCA GCT -   -   -   -   -   -   GAC ACA
```

FIG. 6A–1

```
.BRU
                             460                                                            470                                                          480
 N   F   L   Q   S   R   P   E   P   T   A   P   P   F   L   Q   S   R   P   E   P   T   A   P   P   E   E
AAT TTT CTT CAG AGC AGA CCA GAG CCA ACA GCC CCA CCA TTT CTT CAG AGC AGA CCA GAG CCA ACA GCC CCA CCA GAA GAG

2
 N   F   L   Q   S   R   P   E   P   T   A   P   P                                                  E   E
AAT TTT CTT CAG AGC AGA CCA GAG CCA ACA GCC CCA CCA -   -   -   -   -   -   -   -   -   -   -   -  GAA GAG

.MAL
 N   F   L   Q   S   R   P   E   P   T   A   P   P                                                  A   E
AAT TTC CTT CAG AGC AGA CCA GAG CCA ACA GCC CCA CCA -   -   -   -   -   -   -   -   -   -   -   -  GCA GAG

.ELI
 N   F   L   Q   S   R   P   E   P   T   A   P   P                                                  A   E
AAC TTT CTC CAA AGC AGA CCA GAG CCA ACA GCC CCA CCA -   -   -   -   -   -   -   -   -   -   -   -  GCA GAG
```

FIG. 6A-2

```
c
                          20                                                      30
LAV.BRU     R   M   R                    R   A   E   P   A
            AGA ATG AGA  -   -   -   -  CGA GCT GAG CCA GCA

ARV 2       R   M   R    R   A   E   P   R   A   E   P   A
            AGA ATG AGA [CGA GCT GAG CCA][CGA GCT GAG CCA] GCA

LAV.MAL     R   I   R                    R   T   P   P   T
            AGA ATA AGA  -   -   -   -  CGA ACT CCC CCA ACA

LAV.ELI     R   I   R                    R   T   P   P   T
            AGA ATA AGA  -   -   -   -  AGA ACT AAT CCA GCA

d
                                    40
LAV.BRU     V   G   A   A   S   R                            D
            GTG GGA GCA GCA TCT CGA  -   -   -   -   -   -  GAC

ARV 2       V   G   A   V   S   R                            D
            GTG GGA GCA GTA TCT CGA  -   -   -   -   -   -  GAC

LAV.MAL     V   G   A   V   S   R    D   A   V   S   Q   D
            GTA [GGA GCA GTA TCT CAA][GAT GCA GTA TCT CAA] GAT

LAV.ELI     V   G   A   V   S   R                            D
            GTA GGA GCA GTA TCT CGA  -   -   -   -   -   -  GAC
```

FIG. 6A-3

ENV

e

```
                                            20
          Q   H   L    W   R   W   G    W   K   W   G    T   M   L
LAV.BRU  CAG CAC TTG  TGG ACA TGG GGC  TGG AAA TGG GGC  ACC ATG CTC

          Q   H   L   W   R   W   G                     T   L   L
ARV 2    CAG CAC TTG TGG AGA TGG GGC   -   -   -   -   ACC TTG CTC

          Q   N   W   W   R   W   G                     M   M   L
LAV.MAL  CAA AAC TGG TGG AGA TGG GGC   -   -   -   -   ATG ATG CTC

          Q   N   W   W   K   W   G                     T   M   L
LAV.ELI  CAA AAC TGG TGG AAA TCG GGC   -   -   -   -   ATC ATG CTC
```

FIG. 6B-1

f

```
LAV.BRU                        140                                    150
 L   K   C   T   D   L       G   N   A   T    N   T   N   S   S    N   T   N   S   S    S   G   E
TTA AAG TGC ACT GAT TTG  -  GGG AAT GCT ACT  AAT ACC AAT AGT AGT  AAT ACC AAT AGT AGT  AGC GGG GAA
 M   M   M   E       K   G   E   I
ATG ATG ATG GAG  -  AAA GCA GAG ATA

ARV 2
 L   N   C   T   D   L       G   K   A   T   N   T   N   S   S                              M
TTA AAT TGC ACT GAT TTG  -  GGG AAG GCT ACT AAT ACC AAT AGT AGT  -   -   -   -   -   -   -  AAT
 W    K   E   E   I    K   G   E   I
TGG  AAA GAA GAA ATA  AAA GGA GAA ATA
```

LAV.MAL

```
 L   N   C   T   N   V   N   G   T   A   V   N   G   T   N   A   G   S   N   R   T   N   A   E
TTA AAC TGC ACT AAT GTG AAT GGG ACT GCT GTG AAT GGG ACT AAT GCT GGG AGT AAT AGG ACT AAT GCA GAA

 L   K   M   E   I       G   E   V
TTG AAA ATG GAA ATT  -  GGA GAA GTG
```

LAV.ELI

```
 L   N   C   S   D   E           L   R   N   N   G   T   M   G   N   N   V   T   T   E   E   K
TTA AAC TGT AGT GAT GAA  -   -  TTG AGG AAC AAT GGC ACT ATG GGG AAC AAT GTC ACT ACA GAG GAG AAA

 G                           M
GGA  -   -   -   -   -   -  ATG
```

FIG. 6B–2

```
                           200
g         D   N   D   T   T   S                         Y   T   L
LAV.BRU  GAT AAT GAT ACT ACC AGC  -   -   -   -   -    TAT ACG TTG

          D   N   A   S   T   T   T   N   Y   T   N   Y   R   L
ARV 2    GAT AAT GCT AGT ACT ACT ACC AAC TAT ACC AAC TAT AGG TTG

          D   D   S   D   N   S   S                     Y   R   L
LAV.MAL  GAT GAT AGT GAT AAT AGT AGT  -   -   -   -    TAT AGG CTA

          D   N   D   S   S   T       N   S   T   N   Y   R   L
LAV.ELI  GAC AAT GAT AGT AGT ACC  -  AAT AGT ACC AAT TAT AGG TTA
```

FIG. 6B-3

```
h
LAV.BRU                    410                                        420
 C   N   S   T   Q   L   F   N   S   T   W   F   N   S   T   W   S   T   E   G   S   N   N   T   E   G
TGT AAT TCA ACA CAA CTG TTT AAT AGT ACT TGG TTT AAT AGT ACT TGG AGT ACT GAA GGG TCA AAT AAC ACT GAA GGA
        430
 S   D   T   I
AGT GAC ACA ATC

ARV 2
 C   N   T   T   Q   L   F   N   N   T   W                       R   L   N   H   T   K   G   T   K   G
TGT AAT ACA ACA CAA CTG TTT AAT AAT ACA TGG  -   -   -   -   -  AGG TTA AAT CAC ACT GAA GGA ACT AAA GGA

 N   D   T   I
AAT GAC ACA ATC
```

```
LAV.MAL

 C   N   T   S   K   L   F   N   S   T   W   Q   N   N   G   A   R   L           S   N   S   T   E   S
TGT AAT ACA TCA AAA CTG TTT AAT AGT ACA TGG CAG AAT AAT GGT GCA AGA CTA  -   -  AGT AAT AGC ACA GAG TCA

 T   G   S   I
ACT GGT AGT ATC

LAV.ELI

 C   N   T   S   G   L   F   N   S   T   W   N   I   S   A   W   N   N   I   T   E   S   N   N   S   T
TGT AAT ACA TCA GGA CTG TTT AAT AGT ACA TGG AAT ATT AGT GCA TGG AAT AAT ATT ACA GAG TCA AAT AAT AGC ACA

 N   T   N   I
AAC ACA AAC ATC
```

FIG. 6B-4

LAV.ELI

→R
GGTCTCTCTGGTTAGACCAGATTTGAGCCTGGGAGCTCTCTGGCTAGCTAGGGAACCCAC

R ←→ U5
TGCTTAAGCCTCAATAAAGCTTGCCTTGAGTGCTTCAAGTAGTGTGTGCCCGTCTGTTGT

100
GTGACTCTGGTAACTAGAGATCCCTCAGACCCTTTAGTCAGTGGAAAATCTCTAGCA

U5←
GTGGCGCCCGAACAGGGACCTGAAAGCGAAAGTAGAACCAGAGGAGCTCTCTCGACGCAG

200
GACTCGGCTTGCTGAAGCGCGCACGGCAAGAGGCGAGGGGCAGCGACTGGTGAGTACGCT

→GAG. 300
MetGlyAlaArgAlaSerValLeuSer
AAAATTTTTGACTAGCGGAGGCTAGAAGGAGAGAGATGGGTGCGAGAGCGTCAGTATTAA

GlyGlyLysLeuAspLysTrpGluLysIleArgLeuArgProGlyGlyLysLysLysTyr
GCGGGGGAAAATTAGATAAATGGGAAAAAATTCGGTTACGGCCAGGAGGAAAGAAAAAAT

400
ArgLeuLysHisIleValTrpAlaSerArgGluLeuGluArgTyrAlaLeuAsnProGly
ATAGACTAAAACATATAGTATGGGCAAGCAGGGAGCTAGAACGATATGCACTTAATCCTG

LeuLeuGluThrSerGluGlyCysLysGlnIleIleGlyGlnLeuGlnProAlaIleGln
GCCTTTTAGAAACATCAGAAGGCTGTAAACAAATAATAGGGCAGCTACAACCAGCTATTC

500
ThrGlyThrGluGluLeuArgSerLeuTyrAsnThrValAlaThrLeuTyrCysValHis
AGACAGGAACAGAAGAACTTAGATCATTATATAATACAGTAGCAACCCTCTATTGTGTAC

600
LysGlyIleAspValLysAspThrLysGluAlaLeuGluLysMetGluGluGluGlnAsn
ATAAAGGAATAGATGTAAAAGACACCAAGGAAGCTTTAGAAAAGATGGAGGAAGAGCAAA

LysSerLysLysLysAlaGlnGlnAlaAlaAlaAspThrGlyAsnAsnSerGlnValSer
ACAAAAGTAAGAAAAAGGCACAGCAAGCAGCAGCTGACACAGGAAACAACAGCCAGGTCA

700
GlnAsnTyrProIleValGlnAsnLeuGlnGlyGlnMetValHisGlnAlaIleSerPro
GCCAAAATTATCCTATAGTGCAGAACCTACAGGGGCAAATGGTACATCAGGCCATATCAC

ArgThrLeuAsnAlaTrpValLysValIleGluGluLysAlaPheSerProGluValIle
CTAGAACTTTGAACGCATGGGTAAAAGTAATAGAAGAAAAGGCTTTCAGCCCAGAAGTAA

800
ProMetPheSerAlaLeuSerGluGlyAlaThrProGlnAspLeuAsnThrMetLeuAsn
TACCCATGTTTTCAGCATTATCAGAAGGAGCCACCCCACAAGATTTAAACACCATGCTAA

900
ThrValGlyGlyHisGlnAlaAlaMetGlnMetLeuLysGluThrIleAsnGluGluAla
ACACAGTGGGGGGACATCAAGCAGCCATGCAAATGCTAAAAGAGACCATCAATGAAGAAG

AlaGluTrpAspArgLeuHisProValHisAlaGlyProIleAlaProGlyGlnMetArg
CTGCAGAATGGGATAGGTTACATCCAGTGCATGCAGGGCCTATTGCACCAGGCCAGATGA

1000
GluProArgGlySerAspIleAlaGlyThrThrSerThrLeuGlnGluGlnIleAlaTrp
GAGAACCAAGGGGAAGTGATATAGCAGGAACTACTAGTACCCTTCAGGAACAAATAGCAT

MetThrSerAsnProProIleProValGlyGluIleTyrLysArgTrpIleIleValGly
GGATGACAAGTAACCCACCTATCCCAGTAGGAGAAATCTATAAAAGATGGATAATTGTGG

1100
LeuAsnLysIleValArgMetTyrSerProValSerIleLeuAspIleArgGlnGlyPro
GATTAAATAAAATAGTAAGAATGTATAGCCCTGTCAGCATTTTGGACATAAGACAGGGAC

1200

FIG. 7A

```
 LysGluProPheArgAspTyrValAspArgPheTyrLysThrLeuArgAlaGluGlnAla
CAAAGGAACCTTTTAGAGACTATGTAGACCGGTTCTATAAAACTCTAAGAGCCGAGCAAG

 SerGlnAspValLysAsnTrpMetThrGluThrLeuLeuValGlnAsnAlaAsnProAsp
CTTCACAGGATGTAAAAAATTGGATGACAGAAACCTTGTTGGTCCAAAATGCAAACCCAG
                                          1300
 CysLysThrIleLeuLysAlaLeuGlyProGlnAlaThrLeuGluGluMetMetThrAla
ATTGCAAGACTATCTTAAAAGCATTGGGACCACAGGCTACACTAGAAGAAATGATGACAG

 CysGlnGlyValGlyGlyProSerHisLysAlaArgValLeuAlaGluAlaMetSerGln
CATGTCAGGGAGTGGGGGGCCCAGCCATAAAGCAAGAGTTCTGGCTGAGGCAATGAGCC
               1400
 AlaThrAsnSerValThrThrAlaMetMetGlnArgGlyAsnPheLysGlyProArgLys
AAGCAACAAATTCAGTTACTACAGCAATGATGCAGAGAGGCAATTTTAAGGGCCCAAGAA
                                                         1500
 IleIleLysCysPheAsnCysGlyLysGluGlyHisIleAlaLysAsnCysArgAlaPro
AAATTATTAAGTGTTTCAATTGTGGCAAAGAAGGGCACATAGCAAAAAATTGCAGGGCCC

 ArgLysLysGlyCysTrpArgCysGlyLysGluGlyHisGlnLeuLysAspCysThrGlu
CTAGGAAAAAGGGCTGTTGGAGATGTGGAAAGGAAGGACACCAACTAAAAGATTGCACTG
          →POL                            1600
          PhePheArgGluAsnLeuAlaPheProGlnGlyLysAlaGlyGluLeu
 ArgGlnAlaAsnPheLeuGlyArgIleTrpProSerHisLysGlyArgProGlyAsnPhe
AGAGACAGGCTAATTTTTTAGGGAGAATTTGGCCTTCCCACAAGGGAAGGCCGGGGAACT

 SerProLysGlnThrArgAlaAsnSerProThrSerArgGluLeuArgValTrpGlyArg
 LeuGlnSerArgProGluProThrAlaProProAlaGluSerPheGlyPheGlyGluGlu
TTCTCCAAAGCAGACCAGAGCCAACAGCCCCACCAGCAGAGAGCTTCGGGTTTGGGGAAG
               1700
 AspAsnProLeuSerLysThrGlyAlaGluArgGlnGlyThrValSerPheAsnPhePro
 IleThrProSerGlnLysGlnGluGlnLysAspLysGluLeuTyrProLeuThrSerLeu
AGATAACCCCCTCTCAAAAACAGGAGCAGAAAGACAAGGAACTGTATCCTTTAACTTCCC
                               .GAG←                      1800
 GlnIleThrLeuTrpGlnArgProLeuValAlaIleLysIleGlyGlyGlnLeuLysGlu
 LysSerLeuPheGlyAsnAspProLeuSerGln
TCAAATCACTCTTTGGCAACGACCCCTTGTCGCAATAAAAATAGGGGGACAGCTAAAGGA

 AlaLeuLeuAspThrGlyAlaAspAspThrValLeuGluGluMetAsnLeuProGlyLys
AGCTCTATTAGATACAGGAGCAGATGATACAGTATTAGAAGAAATGAATTTGCCAGGAAA
                                          1900
 TrpLysProLysMetIleGlyGlyIleGlyGlyPheIleLysValArgGlnTyrAspGln
ATGGAAACCAAAAATGATAGGGGGAATTGGAGGTTTTATCAAAGTAAGACAGTATGATCA

 IleProIleGluIleCysGlyGlnLysAlaIleGlyThrValLeuValGlyProThrPro
AATACCCATAGAAATCTGTGGACAGAAAGCTATAGGTACAGTATTAGTAGGACCTACGCC
               2000
 ValAsnIleIleGlyArgAsnLeuLeuThrGlnIleGlyCysThrLeuAsnPheProIle
TGTCAACATAATCGGAAGAAATTTGTTGACCCAGATTGGCTGCACTTTAAATTTTCCAAT
                                                         2100
 SerProIleGluThrValProValLysLeuLysProGlyMetAspGlyProLysValLys
TAGTCCTATTGAAACTGTACCAGTAAAATTAAAGCCAGGAATGGATGGCCCAAAAGTTAA

 GlnTrpProLeuThrGluGluLysIleLysAlaLeuThrGluIleCysThrAspMetGlu
ACAATGGCCATTGACAGAAGAAAAAATAAAAGCATTAACAGAAATTTGTACAGATATGGA
                                          2200
```

FIG. 7B

```
 LysGluGlyLysIleSerArgIleGlyProGluAsnProTyrAsnThrProIlePheAla
AAAGGAAGGAAAAATTTCAAGAATTGGGCCTGAAAATCCATACAATACTCCAATATTTGC

 IleLysLysLysAspSerThrLysTrpArgLysLeuValAspPheArgGluLeuAsnLys
CATAAAGAAAAAAGACAGTACCAAGTGGAGAAAATTAGTAGATTTCAGAGAACTTAATAA
               2300
 ArgThrGlnAspPheTrpGluValGlnLeuGlyIleProHisProAlaGlyLeuLysLys
GAGAACTCAAGATTTCTGGGAAGTTCAATTAGGAATACCGCATCCTGCAGGGCTGAAAAA
                                                        2400
 LysLysSerValThrValLeuAspValGlyAspAlaTyrPheSerValProLeuAspGlu
GAAAAAATCAGTAACAGTACTGGATGTGGGTGATGCATATTTTTCAGTTCCCTTAGATGA

 AspPheArgLysTyrThrAlaPheThrIleSerSerIleAsnAsnGluThrProGlyIle
AGATTTTAGGAAATATACCGCCTTTACCATATCTAGTATAAACAATGAGACACCAGGGAT
                                       2500
 ArgTyrGlnTyrAsnValLeuProGlnGlyTrpLysGlySerProAlaIlePheGlnSer
TAGATATCAGTACAATGTGCTTCCACAGGGATGGAAAGGATCACCGGCAATATTCCAAAG

 SerMetThrLysIleLeuGluProPheArgLysGlnAsnProGluMetValIleTyrGln
TAGCATGACAAAAATCTTAGAGCCCTTTAGAAAACAAAATCCAGAAATGGTTATCTATCA
               2600
 TyrMetAspAspLeuTyrValGlySerAspLeuGluIleGlyGlnHisArgThrLysIle
ATACATGGATGATTTGTATGTAGGATCTGACTTAGAAATAGGGCAGCATAGGACAAAAAT
                                                        2700
 GluLysLeuArgGluHisLeuLeuArgTrpGlyPheThrArgProAspLysLysHisGln
AGAGAAATTAAGAGAACATCTATTGAGGTGGGGATTTACCAGACCAGATAAAAAACATCA

 LysGluProProPheLeuTrpMetGlyTyrGluLeuHisProAspLysTrpThrValGln
GAAAGAACCCCCATTTCTTTGGATGGGTTATGAACTCCATCCTGATAAATGGACAGTACA
                                       2800
 SerIleLysLeuProGluLysGluSerTrpThrValAsnAspIleGlnAsnLeuValGlu
GTCTATAAAACTGCCAGAAAAGGAGAGCTGGACTGTCAATGATATACAGAACTTAGTGGA

 ArgLeuAsnTrpAlaSerGlnIleTyrProGlyIleLysValArgGlnLeuCysLysLeu
GAGATTAAACTGGGCAAGCCAGATTTATCCAGGAATTAAAGTAAGACAATTATGTAAACT
               2900
 LeuArgGlyThrLysAlaLeuThrGluValIleProLeuThrGluGluAlaGluLeuGlu
CCTTAGGGGAACCAAAGCACTAACAGAAGTAATACCACTAACAGAAGAAGCAGAATTAGA
                                                        3000
 LeuAlaGluAsnArgGluIleLeuLysGluProValHisGlyValTyrTyrAspProSer
ACTGGCAGAAAACAGGGAAATTTTAAAAGAACCAGTACATGGAGTGTATTATGACCCATC

 LysAspLeuIleAlaGluIleGlnLysGlnGlyHisGlyGlnTrpThrTyrGlnIleTyr
AAAAGACTTAATAGCAGAAATACAGAAACAAGGGCACGGCCAATGGACATACCAAATTTA
                                       3100
 GlnGluProPheLysAsnLeuLysThrGlyLysTyrAlaArgMetArgGlyAlaHisThr
TCAAGAACCATTTAAAAATCTGAAAACAGGAAAGTATGCAAGAATGAGGGGTGCCCACAC

 AsnAspValLysGlnLeuAlaGluAlaValGlnArgIleSerThrGluSerIleValIle
TAATGATGTAAAGCAATTAGCAGAGGCAGTGCAAAGAATATCCACAGAAAGCATAGTGAT
               3200
 TrpGlyArgThrProLysPheArgLeuProIleGlnLysGluThrTrpGluThrTrpTrp
ATGGGGAAGGACTCCTAAATTTAGACTACCCATACAAAAGGAAACATGGGAAACATGGTG
                                                        3300
```

FIG. 7C

```
 AlaGluTyrTrpGlnAlaThrTrpIleProGluTrpGluPheValAsnThrProProLeu
GGCAGAGTATTGGCAAGCCACTTGGATTCCTGAGTGGGAATTTGTCAATACCCCTCCTTT

 ValLysLeuTrpTyrGlnLeuGluLysGluProIleIleGlyAlaGluThrPheTyrVal
AGTAAAATTATGGTACCAGTTAGAGAAGGAACCCATAATAGGAGCAGAAACTTTCTATGT
                                                3400
 AspGlyAlaAlaAsnArgGluThrLysLeuGlyLysAlaGlyTyrValThrAspArgGly
AGATGGGGCAGCTAATAGAGAGACTAAATTAGGAAAAGCAGGATATGTTACTGACAGAGG

 ArgGlnLysValValProLeuThrAspThrThrAsnGlnLysThrGluLeuGlnAlaIle
AAGACAGAAAGTTGTCCCTTTGACTGACACGACAAATCAGAAGACTGAGTTACAAGCAAT
                3500
 AsnLeuAlaLeuGlnAspSerGlyLeuGluValAsnIleValThrAspSerGlnTyrAla
TAATCTAGCCTTGCAGGATTCGGGATTAGAAGTAAACATAGTAACAGATTCACAATATGC
                                                            3600
 LeuGlyIleIleGlnAlaGlnProAspLysSerGluSerGluLeuValAsnGlnIleIle
ATTAGGAATCATTCAAGCACAACCAGATAAGAGTGAATCAGAGTTAGTCAATCAAATAAT

 GluGlnLeuIleLysLysGluLysValTyrLeuAlaTrpValProAlaHisLysGlyIle
AGAGCAGTTAATAAAAAAGGAAAAGGTTTACCTGGCATGGGTACCAGCACACAAAGGAAT
                                                3700
 GlyGlyAsnGluGlnValAspLysLeuValSerGlnGlyIleArgLysValLeuPheLeu
TGGAGGAAATGAACAAGTAGATAAATTAGTCAGTCAAGGAATCAGGAAAGTACTATTTTT

 AspGlyIleAspLysAlaGlnGluGluHisGluLysTyrHisAsnAsnTrpArgAlaMet
GGATGGAATAGATAAGGCTCAAGAAGAACATGAGAAATATCACAACAATTGGAGAGCAAT
                3800
 AlaSerAspPheAsnLeuProProValValAlaLysGluIleValAlaSerCysAspLys
GGCTAGTGATTTTAACCTACCACCCGTGGTAGCAAAAGAAATAGTAGCTAGCTGTGATAA
                                                            3900
 CysGlnLeuLysGlyGluAlaMetHisGlyGlnValAspCysSerProGlyIleTrpGln
ATGTCAGCTAAAAGGAGAAGCCATGCATGGACAAGTAGACTGTAGTCCAGGAATATGGCA

 LeuAspCysThrHisLeuGluGlyLysValIleLeuValAlaValHisValAlaSerGly
ATTAGATTGTACACACTTAGAAGGAAAAGTTATCCTGGTAGCAGTTCATGTAGCCAGTGG
                                                4000
 TyrIleGluAlaGluValIleProAlaGluThrGlyGlnGluThrAlaTyrPheLeuLeu
CTATATAGAAGCAGAAGTTATTCCAGCAGAAACAGGGCAGGAAACAGCATATTTTCTTTT

 LysLeuAlaGlyArgTrpProValLysValValHisThrAspAsnGlySerAsnPheThr
AAAATTAGCAGGAAGATGGCCAGTAAAAGTAGTACATACAGACAATGGCAGCAATTTCAC
                4100
 SerAlaAlaValLysAlaAlaCysTrpTrpAlaGlyIleLysGlnGluPheGlyIlePro
CAGTGCTGCAGTTAAGGCCGCCTGTTGGTGGGCAGGTATCAAACAGGAATTTGGAATTCC
                                                            4200
 TyrAsnProGlnSerGlnGlyValValGluSerMetAsnLysGluLeuLysLysIleIle
CTACAATCCCCAAAGTCAAGGAGTAGTAGAATCTATGAATAAAGAATTAAAGAAAATTAT

 GlyGlnValArgAspGlnAlaGluHisLeuLysThrAlaValGlnMetAlaValPheIle
AGGACAGGTAAGAGATCAAGCTGAACATCTTAAGACAGCAGTACAAATGGCAGTATTCAT
                                                4300
 HisAsnPheLysArgArgArgGlyIleGlyGlyTyrSerAlaGlyGluArgIleIleAsp
CCACAATTTTAAAAGAAGAAGGGGGATTGGGGGATACAGTGCAGGGGAAAGAATAATAGA
```

FIG. 7D

```
IleIleAlaThrAspIleGlnThrLysGluLeuGlnLysGlnIleIleLysIleGlnAsn
CATAATAGCAACAGACATACAAACTAAAGAATTACAAAAACAAATTATAAAAATTCAAAA
            4400
PheArgValTyrTyrArgAspSerArgAspProIleTrpLysGlyProAlaLysLeuLeu
TTTTCGGGTTTATTACAGAGACAGCAGAGATCCAATTTGGAAAGGACCAGCAAAGCTCCT
                                                        4500
TrpLysGlyGluGlyAlaValValIleGlnAspLysSerAspIleLysValValProArg
CTGGAAAGGTGAAGGGGCAGTAGTAATACAAGACAAGAGTGACATAAAGGTAGTACCAAG
                          →Q
ArgLysValLysIleIleArgAspTyrGlyLysGlnMetAlaGlyAspAspCysValAla
                          MetGluAsnArgTrpGlnValMetIleValTrpGln
AAGAAAAGTAAAGATTATTAGGGATTATGGAAAACAGATGGCAGGTGATGATTGTGTGGC
          POL←                          4600
SerArgGlnAspGluAsp
 ValAspArgMetArgIleLysThrTrpLysSerLeuValLysHisHisMetTyrValSer
AAGTAGACAGGATGAGGATTAAAACATGGAAAAGTTTAGTAAAACACCATATGTATGTTT

 LysLysAlaAsnArgTrpPheTyrArgHisHisTyrGluSerProHisProLysIleSer
CAAAGAAAGCTAACAGATGGTTTTATAGACATCACTATGAAAGCCCCCACCCAAAAATAA
            4700
 SerGluValHisIleProLeuGlyGluAlaArgLeuValIleLysThrTyrTrpGlyLeu
GTTCAGAAGTACACATCCCACTAGGAGAAGCTAGACTGGTAATAAAAACATATTGGGGTC
                                                        4800
 HisThrGlyGluArgGluTrpHisLeuGlyGlnGlyValSerIleGluTrpArgLysArg
TGCATACAGGAGAAAGAGAATGGCATCTGGGTCAGGGAGTCTCCATAGAATGGAGGAAAA

 ArgTyrSerThrGlnValAspProGlyLeuAlaAspGlnLeuIleHisMetTyrTyrPhe
GGAGATATAGCACACAAGTAGACCCTGGCCTGGCAGACCAACTAATTCATATGTATTATT
                                        4900
 AspCysPheSerGluSerAlaIleArgLysAlaIleLeuGlyAspIleValSerProArg
TTGATTGTTTTTCAGAATCTGCTATAAGAAAAGCCATATTAGGAGATATAGTTAGTCCTA

 CysGluTyrGlnAlaGlyHisAsnLysValGlySerLeuGlnTyrLeuAlaLeuThrAla
GGTGTGAGTATCAAGCAGGACATAACAAGGTAGGATCCCTACAGTATTTGGCACTAACAG
            5000
 LeuIleAlaProLysGlnIleLysProProLeuProSerValArgLysLeuThrGluAsp
CATTAATAGCACCAAAACAGATAAAGCCACCTTTGCCTAGTGTTAGGAAGCTAACAGAAG
  →R                                                    5100
   MetGluGlnAlaProAlaAspGlnGlyProGlnArgGluProTyrAsnGluTrpAla
 ArgTrpAsnLysProGlnGlnThrArgGlyHisArgGlySerHisThrMetAsnGlyHis
ATAGATGGAACAAGCCCCAGCAGACCAGGGGCCACAGAGGGAGCCATACAATGAATGGGC
Q←
 LeuGluLeuLeuGluGluLeuLysSerGluAlaValArgHisPheProArgIleTrpLeu
ATTAGAGCTTTTAGAGGAGCTTAAGAGTGAAGCTGTTAGACATTTTCCTAGGATATGGCT
                                        5200
 HisSerLeuGlyGlnHisIleTyrGluThrTyrGlyAspThrTrpValGlyValGluAla
CCATAGCTTAGGACAACATATTTATGAAACTTATGGGGATACCTGGGTAGGAGTTGAAGC

 IleIleArgIleLeuGlnGlnLeuLeuPheIleHisPheArgIleGlyCysGlnHisSer
TATAATAAGAATACTGCAACAATTACTGTTTATTCATTTCAGAATTGGGTGTCAACATAG
            5300                        →S          R←
 ArgIleGlyIleIleArgGlnArgArgAlaArgAsnGlySerSerArgSer
                                 MetAspProValAspProAsnLeuGlu
CAGAATAGGCATTATTCGACAGAGAAGAGCAAGAAATGGATCCAGTAGATCCTAACCTAG
                                                        5400
```

FIG. 7E

```
 ProTrpAsnHisProGlySerGlnProArgThrProCysAsnLysCysHisCysLysLys
AGCCCTGGAACCATCCAGGAAGTCAGCCTAGGACTCCTTGTAACAAGTGTCATTGTAAAA

 CysCysTyrHisCysProValCysPheLeuAsnLysGlyLeuGlyIleSerTyrGlyArg
AGTGTTGCTATCATTGCCCAGTTTGCTTCTTAAACAAAGGCTTAGGCATCTCCTATGGCA
                                        5500
 LysLysArgArgGlnArgArgGlyProProGlnGlyGlyGlnAlaHisGlnValProIle
GGAAGAAGCGGAGACAGCGACGAGGACCTCCTCAAGGCGGTCAGGCTCATCAAGTTCCTA
        S ←
 ProLysGln
TACCAAAGCAGTAAGTAGTACATGTAATGCAACCTTTAGGGATAATAGCAATAGCAGCAT
                    5600
TAGTAGTAGCAATAATACTAGCAATAGTTGTGTGGACCATAGTATTCATAGAATATAGAA
                                                         5700
GGATAAAAAAGCAAAGGAGAATAGACTGTTTACTTGATAGAATAACAGAAAGAGCAGAAG
          → ENV
          MetArgAlaArgGlyIleGluArgAsnCysGlnAsnTrpTrpLysTrpGly
ACAGTGGCAATGAGAGCGAGGGGGATAGAGAGAAATTGTCAAAACTGGTGGAAATGGGGC
                                        5800
IleMetLeuLeuGlyIleLeuMetThrCysSerAlaAlaAspAsnLeuTrpValThrVal
ATCATGCTCCTTGGGATATTGATGACCTGTAGTGCTGCAGACAATCTGTGGGTCACAGTT

TyrTyrGlyValProValTrpLysGluAlaThrThrThrLeuPheCysAlaSerAspAla
TATTATGGGGTGCCTGTATGGAAGGAAGCAACCACCACTCTATTTTGTGCATCAGATGCT
                    5900
LysSerTyrGluThrGluAlaHisAsnIleTrpAlaThrHisAlaCysValProThrAsp
AAATCATATGAAACAGAGGCACATAATATCTGGGCCACACATGCCTGTGTACCCACGGAC
                                                         6000
ProAsnProGlnGluIleAlaLeuGluAsnValThrGluAsnPheAsnMetTrpLysAsn
CCCAACCCACAAGAAATAGCACTGGAAAATGTGACAGAAAACTTTAACATGTGGAAAAAT

AsnMetValGluGlnMetHisGluAspIleIleSerLeuTrpAspGlnSerLeuLysPro
AACATGGTGGAACAGATGCATGAGGATATAATCAGTTTATGGGATCAAAGCCTAAAACCA
                                        6100
CysValLysLeuThrProLeuCysValThrLeuAsnCysSerAspGluLeuArgAsnAsn
TGTGTAAAATTAACCCCACTCTGTGTCACTTTAAACTGTAGTGATGAATTGAGGAACAAT

GlyThrMetGlyAsnAsnValThrThrGluGluLysGlyMetLysAsnCysSerPheAsn
GGCACTATGGGGAACAATGTCACTACAGAGGAGAAAGGAATGAAAAACTGCTCTTTCAAT
                    6200
ValThrThrValLeuLysAspLysLysGlnGlnValTyrAlaLeuPheTyrArgLeuAsp
GTAACCACAGTACTAAAAGATAAGAAGCAGCAAGTATATGCACTTTTTTATAGACTTGAT
                                                         6300
IleValProIleAspAsnAspSerSerThrAsnSerThrAsnTyrArgLeuIleAsnCys
ATAGTACCAATAGACAATGATAGTAGTACCAATAGTACCAATTATAGGTTAATAAATTGT

AsnThrSerAlaIleThrGlnAlaCysProLysValSerPheGluProIleProIleHis
AATACCTCAGCCATTACACAGGCTTGTCCAAAGGTATCCTTTGAGCCAATTCCCATACAT
                                        6400
TyrCysAlaProAlaGlyPheAlaIleLeuLysCysArgAspLysLysPheAsnGlyThr
TATTGTGCCCCAGCTGGTTTTGCGATTCTAAAGTGTAGAGATAAGAAGTTCAATGGAACA

GlyProCysThrAsnValSerThrValGlnCysThrHisGlyIleArgProValValSer
GGCCCATGCACAAATGTCAGCACAGTACAATGTACACATGGAATTAGGCCAGTGGTGTCA
                    6500
```

FIG. 7F

ThrGlnLeuLeuLeuAsnGlySerLeuAlaGluGluGluValIleIleArgSerGluAsn

ACTCAACTGCTGTTGAATGGCAGTCTAGCAGAAGAAGAGGTCATAATTAGATCCGAAAAT

6600

LeuThrAsnAsnAlaLysAsnIleIleAlaHisLeuAsnGluSerValLysIleThrCys

CTCACAAACAATGCTAAAAACATAATAGCACATCTTAATGAATCTGTAAAAATTACCTGT

AlaArgProTyrGlnAsnThrArgGlnArgThrProIleGlyLeuGlyGlnSerLeuTyr

GCAAGGCCCTATCAAAATACAAGACAAAGAACACCTATAGGACTAGGGCAATCACTCTAT

6700

ThrThrArgSerArgSerIleIleGlyGlnAlaHisCysAsnIleSerArgAlaGlnTrp

ACTACAAGATCAAGATCAATAATAGGACAAGCACATTGTAATATTAGTAGAGCACAATGG

SerLysThrLeuGlnGlnValAlaArgLysLeuGlyThrLeuLeuAsnLysThrIleIle

AGTAAAACTTTACAACAAGTAGCTAGAAAATTAGGAACCCTTCTTAACAAAACAATAATA

6800

LysPheLysProSerSerGlyGlyAspProGluIleThrThrHisSerPheAsnCysGly

AAGTTTAAACCATCCTCAGGAGGGGACCCAGAAATTACAACACACAGTTTTAATTGTGGA

6900

GlyGluPhePheTyrCysAsnThrSerGlyLeuPheAsnSerThrTrpAsnIleSerAla

GGGGAATTCTTCTACTGTAATACATCAGGACTGTTTAATAGTACATGGAATATTAGTGCA

TrpAsnAsnIleThrGluSerAsnAsnSerThrAsnThrAsnIleThrLeuGlnCysArg

TGGAATAATATTACAGAGTCAAATAATAGCACAAACACAAACATCACACTCCAATGCAGA

7000

IleLysGlnIleIleLysMetValAlaGlyArgLysAlaIleTyrAlaProProIleGlu

ATAAAACAAATTATAAAGATGGTGGCAGGCAGGAAAGCAATATATGCCCCTCCTATCGAA

ArgAsnIleLeuCysSerSerAsnIleThrGlyLeuLeuLeuThrArgAspGlyGlyIle

AGAAACATTCTATGTTCATCAAATATTACAGGGCTACTATTGACAAGAGATGGTGGTATA

7100

AsnAsnSerThrAsnGluThrPheArgProGlyGlyGlyAspMetArgAspAsnTrpArg

AATAATAGTACTAACGAGACCTTTAGACCTGGAGGAGGAGATATGAGGGACAATTGGAGA

7200

SerGluLeuTyrLysTyrLysValValGlnIleGluProLeuGlyValAlaProThrArg

AGTGAATTATATAAATATAAGGTAGTACAAATTGAACCACTAGGAGTAGCACCCACCAGG

AlaLysArgArgValValGluArgGluLysArgAlaIleGlyLeuGlyAlaMetPheLeu

GCAAAGAGAAGAGTGGTGGAAAGAGAAAAAAGAGCAATAGGATTAGGAGCTATGTTCCTT

7300

GlyPheLeuGlyAlaAlaGlySerThrMetGlyAlaArgSerValThrLeuThrValGln

GGGTTCTTGGGAGCAGCAGGAAGCACGATGGGCGCACGGTCAGTGACGCTGACGGTACAG

AlaArgGlnLeuMetSerGlyIleValGlnGlnGlnAsnAsnLeuLeuArgAlaIleGlu

GCCAGACAATTAATGTCTGGTATAGTGCAACAGCAAAACAATTTGCTGAGGGCTATAGAG

7400

AlaGlnGlnHisLeuLeuGlnLeuThrValTrpGlyIleLysGlnLeuGlnAlaArgIle

GCGCAACAGCATCTGTTGCAACTCACGGTCTGGGGCATTAAACAGCTCCAGGCAAGAATC

7500

LeuAlaValGluArgTyrLeuLysAspGlnGlnLeuLeuGlyIleTrpGlyCysSerGly

CTGGCTGTGGAAAGATACCTAAAGGATCAACAGCTCCTAGGAATTTGGGGTTGCTCTGGA

FIG. 7G

```
LysHisIleCysThrThrAsnValProTrpAsnSerSerTrpSerAsnArgSerLeuAsn
AAACACATTTGCACCACTAATGTGCCCTGGAACTCTAGTTGGAGTAATAGATCTCTAAAT
                                           7600
GluIleTrpGlnAsnMetThrTrpMetGluTrpGluArgGluIleAspAsnTyrThrGly
GAGATTTGGCAGAACATGACCTGGATGGAGTGGGAAAGAGAAATTGACAATTACACAGGC

LeuIleTyrSerLeuIleGluGluSerGlnThrGlnGlnGluLysAsnGluLysGluLeu
TTAATATATAGCTTAATTGAGGAATCGCAGACCCAGCAAGAAAAGAATGAAAAAGAATTG
                 7700
LeuGluLeuAspLysTrpAlaSerLeuTrpAsnTrpPheSerIleThrGlnTrpLeuTrp
TTGGAATTGGACAAGTGGGCAAGTTTGTGGAATTGGTTTAGCATAACACAATGGCTGTGG
                                                            7800
TyrIleLysIlePheIleMetIleIleGlyGlyLeuIleGlyLeuArgIleValPheAla
TATATAAAAATATTCATAATGATAATAGGAGGCTTGATAGGTTTAAGAATAGTTTTTGCT

ValLeuSerLeuValAsnArgValArgGlnGlyTyrSerProLeuSerPheGlnThrLeu
GTGCTTTCTTTAGTAAATAGAGTTAGGCAGGGATACTCACCTCTGTCGTTTCAGACCCTC
                                           7900
LeuProAlaProArgGlyProAspArgProGluGlyThrGluGluGluGlyGlyGluArg
CTCCCAGCCCCGAGGGGACCCGACAGGCCCGAAGGAACAGAAGAAGAAGGTGGAGAGCGA

GlyArgAspArgSerValArgLeuLeuAsnGlyPheSerAlaLeuIleTrpAspAspLeu
GGCAGAGACAGATCCGTGAGATTGCTGAACGGATTCTCGGCACTTATCTGGGACGACCTG
                 8000
ArgSerLeuCysLeuPheSerTyrHisArgLeuArgAspLeuIleLeuIleAlaValArg
CGGAGCCTGTGCCTCTTCAGCTACCACCGCTTGAGAGACTTAATCTTAATTGCAGTGAGG
                                                            8100
IleValGluLeuLeuGlyArgArgGlyTrpAspIleLeuLysTyrLeuTrpAsnLeuLeu
ATTGTAGAACTTCTGGGACGCAGGGGGTGGGACATCCTCAAATATCTGTGGAATCTCCTA

GlnTyrTrpSerGlnGluLeuArgAsnSerAlaSerSerLeuPheAspAlaIleAlaIle
CAGTATTGGAGTCAGGAACTGAGGAACAGTGCTAGTAGCTTGTTTGATGCCATAGCAATA
                                           8200
AlaValAlaGluGlyThrAspArgValIleGluIleIleGlnArgAlaCysArgAlaVal
GCAGTAGCTGAGGGGACAGATAGAGTTATAGAAATAATACAAAGAGCTTGCAGAGCTGTT
                                                W←
LeuAsnIleProArgArgIleArgGlnGlyLeuGluArgSerLeuLeu    →F
                                                    MetGlyGly
CTTAACATACCCAGAAGAATAAGACAGGGCTTAGAAAGGTCTTTACTTTAAAATGGGTGG
                 8300
LysTrpSerLysSerSerIleValGlyTrpProAlaIleArgGluArgIleArgArgThr
CAAATGGTCAAAAAGTAGTATAGTGGGATGGCCTGCTATAAGGGAAAGAATAAGAAGAAC
                                                            8400
AsnProAlaAlaAspGlyValGlyAlaValSerArgAspLeuGluLysHisGlyAlaIle
TAATCCAGCAGCAGATGGGGTAGGAGCAGTATCTCGAGACCTGGAAAAACATGGGGCAAT

ThrSerSerAsnThrAlaSerThrAsnAlaAspCysAlaTrpLeuGluAlaGlnGluGlu
CACAAGTAGCAATACAGCAAGTACTAATGCTGACTGTGCCTGGCTAGAAGCACAAGAAGA
                                           8500
SerAspGluValGlyPheProValArgProGlnValProLeuArgProMetThrTyrLys
GAGCGACGAGGTGGGCTTTCCAGTCAGACCCCAGGTACCTTTAAGACCAATGACTTACAA
                                          →U3
GluAlaLeuAspLeuSerHisPheLeuLysGluLysGlyGlyLeuGluGlyLeuIleTrp
AGAAGCTCTAGATCTCAGCCACTTTTTAAAAGAAAAGGGGGGACTGGAAGGGCTAATTTG
                 8600
```

FIG. 7H

```
 SerLysLysArgGlnGluIleLeuAspLeuTrpValTyrAsnThrGlnGlyIlePhePro
GTCCAAAAAGAGACAAGAGATCCTTGATCTTTGGGTCTACAACACACAAGGCATCTTCCC
                                                        8700
 AspTrpGlnAsnTyrThrProGlyProGlyIleArgTyrProLeuThrPheGlyTrpCys
TGATTGGCAAAACTACACACCAGGGCCAGGGATCAGATATCCACTAACCTTTGGATGGTG

 TyrGluLeuValProValAspProGlnGluValGluGluAspThrGluGlyGluThrAsn
CTACGAGCTAGTACCAGTTGATCCACAGGAGGTAGAAGAAGACACTGAAGGAGAGACCAA
                                    8800
 SerLeuLeuHisProIleCysGlnHisGlyMetGluAspProGluArgGlnValLeuLys
CAGCTTGTTACACCCTATATGCCAGCATGGAATGGAGGACCCGGAGAGACAAGTGTTAAA

 TrpArgPheAsnSerArgLeuAlaPheGluHisLysAlaArgGluMetHisProGluPhe
ATGGAGATTTAACAGCAGACTAGCATTTGAGCACAAGGCCCGAGAGATGCATCCGGAGTT
                8900
 TyrLysAsn
CTACAAAAACTGATGACACCGAGCTTTCTACAAGGGACTTTCCGCTGGGGACTTTCCAGG
                                                        9000
GAGGCGTGGACTGGGCGGGACTGGGGAGTGGCTAACCCTCAGATGCTGCATATAAGCAGC
               U3<-|->R
TGCTTTTTGCCTGTACTGGGTCTCTCTGGTTAGACCAGATTTGAGCCTGGGAGCTCTCTG
                                    9100         B<-
GCTAGCTAGGGAACCCACTGCTTAAGCCTCAATAAAGCTTGCCTTGAGTGCTTCAA
```

FIG. 7I